

NASA Briefs

Children use Internet to learn plane design

A NASA project called Aero Design Team Online is using the Internet to help students learn about airplane design. Students and the general public can visit a website (<http://quest.arc.nasa.gov/aero/>) to find out how aeronautical engineers use airplane models, wind tunnels, supercomputers, simulators and other tools during the airplane design cycle. The project continues through May, although plans are under way to extend it into the summer. "We're teaching about airplane design through the lives of people who are doing the work," said Susan Lee of NASA's Ames Research Center. In addition, kids ask questions via e-mail; learn how an airplane flies; see pictures of aircraft; and participate in Internet chats with people from teams that design and test airplanes.

El Niño image shows warm water thinning

The most recent image from the TOPEX/Poseidon satellite shows the large, warm water pool, commonly referred to as El Niño, has thinned in volume along the central tropical Pacific, indicating that sea level is slowly beginning to return to a more normal state along the equator. The image shows sea surface height relative to normal ocean conditions and sea surface height is an indicator of the heat content of the ocean. The area and volume of the El Niño warm water pool that is affecting global weather patterns remains extremely large, but the pool has thinned along the equator and near the coast of South America. This "thinning" means that the warm water is not as deep as it was a few months ago. Oceanographers indicate they would expect to see this during the ocean's gradual transition back to normal sea level.

Astronomers stalk asteroids with Hubble

Astronomers have stumbled on an unusual asteroid hunting ground: the thousands of images stored in the Hubble Space Telescope archive. The hunt, by Robin Evans and Karl Stapelfeldt of NASA's Jet Propulsion Laboratory, Pasadena, Calif, has yielded a sizable catch of small asteroids—about 100. Their preliminary analysis suggests that a total population of 300,000 small asteroids—essentially rocks just over half a mile to two miles wide (1-3 kilometers)—are orbiting between Mars and Jupiter in a band of space debris known as the main belt. Currently, there are 8,319 confirmed main-belt asteroids whose orbits have been measured, and about the same number have been sighted but not confirmed.

Space research creates medical breakthroughs

In the month of February, when people's attention turned to matters of the heart, and in recognition of American Heart Month, NASA highlighted how its research and technology has led to breakthroughs in the understanding, diagnosis and treatment of heart disease—the number one killer of American men and women.

America's space program has helped revolutionize the practice of medicine through research on the cardiovascular system that is leading

to many break-through discoveries, testing procedures and treatments, many are less painful, less costly and less traumatic to patients.

"I am proud that NASA research is helping doctors treat heart disease," said NASA Administrator Daniel S. Goldin. "This is a fascinating time for medical science, when the developments of our aeronautics and space programs can be applied to a disease that affects so many here on Earth."

A few of today's space-derived improvements include blood pres-

sure monitors, self-adjusting pace-makers, EKGs, exercise equipment and ultrasound images. The technology of tomorrow will include microwave surgery, tissue replacement, heart pumps, low radiation imaging, and fetal imaging.

"Who would have dreamed that lasers used to measure Earth's ozone layer could be used to unclog arteries," Goldin continued. "If the past is our guide, our future in space will continue to advance medical science."

NASA is working with the National

Institutes of Health, the U.S. Department of Health and Human Services, dozens of hospitals, researchers and private companies. These collaborations have resulted in successful new programs to diagnose and treat heart disease.

Astronauts who spend extended periods in space often experience temporary weakening of their hearts and blood vessels. As doctors and researchers work to understand why this happens, their findings can be applied to heart disease on Earth.



JSC Photo S98-02887 by Steve Candler

DIGGING IN-JSC Director George Abbey joins Clear Creek Independent School District trustees in breaking ground for a new intermediate school on the grounds of JSC. From left are Dr. John Wilson, superintendent of Clear Creek ISD; Abbey; Sophia LeCour, board of trustees president; and trustees Ralph Parr and Richard Labrecque. Not pictured are trustees James Main and Cheryl Johnson. Site work has begun on the \$13-million bond-financed school, which is to be finished by the fall of 1999.

Lunar Prospector finds ice evidence

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extends to a depth of about 6.5 feet, he found. On that basis, Lunar Prospector's estimate of water ice would have to be increased by a factor of up to four, to the range of 44 million to 1.3 billion tons. In actuality, Binder and Feldman caution that, due to the inadequacy of existing lunar models, their current estimates "could be off by a factor of ten in either direction."

There are various ways to estimate the economic potential of the detected lunar water ice as a supporting resource for future human exploration of the Moon. One way is to estimate the cost of transporting that same volume of water ice from Earth to orbit. Currently, it costs about \$10,000 to put one pound of material into orbit. NASA is conducting technology research with the goal of reducing that figure by a factor of 10, to only \$1,000 per pound. Using an estimate of 33 million tons from the lower range detected by Lunar Prospector, it would cost \$60 trillion to transport this volume of water to space at that rate, with unknown additional cost of transport to the Moon's surface.

From another perspective, a typical person consumes an estimated 100 gallons of water per day for drinking, food preparation, bathing and washing. At that rate, the same estimate of 33 million tons of water, which translates to 7.2 billion gallons, could support a community of 1,000 two-person households for well over a century on the lunar surface, without recycling.

"This finding by Lunar Prospector is primarily of scientific interest at this time, with implications for the rate and importance of cometary

impacts in the history and evolution of the Solar System," said Dr. Wesley Huntress, NASA associate administrator for space science. "A cost-effective method to mine the water crystals from within this large volume of soil would have to be developed if it were to become a real resource for drinking water or as the basic components of rocket fuel to support any future human explorers."

Before the Lunar Prospector mission, historical tracking data from various NASA Lunar Orbiter and Apollo missions had provided evidence that the lunar gravity field is not uniform. Mass concentrations caused by lava which filled the Moon's huge craters are known to be the cause of the anomalies. However, precise maps of lunar mass concentrations covering the moon's equatorial near-side region were the only ones available.

Lunar Prospector has dramatically improved this situation, according to co-investigator Dr. Alex Konopliv of NASA's Jet Propulsion Laboratory. Telemetry data from Lunar Prospector has been analyzed to produce a full gravity map of both the near and far side of the moon. Konopliv also has identified two new mass concentrations on the Moon's near-side that will be used to enhance geophysical modeling of the lunar interior. This work has produced the first-ever complete engineering-quality gravity map of the Moon, a key to the operational safety and fuel-efficiency of future lunar missions.

"The findings announced today are just the tip of the iceberg compared to the wealth of information forthcoming in the months and years ahead," said NASA's Lunar Prospector mission manager Scott Hubbard of Ames.

NASA-JSC Family Picnic tickets on sale

Tickets are now on sale for the NASA-JSC Family Picnic, set for April 5 at Astroworld, for all NASA badged employees, retirees, and contractors.

The picnic, from 11 a.m.-7:30 p.m. Sunday, will feature a tug of war, horseshoes, face painters, music provided by a DJ, and sand volleyball. Looney Tunes characters and other surprise entertainment also will be on hand. Entertainment will be provided by the Houston Livestock Show and Rodeo speakers committee.

Cost is \$15 per person, ages 3 and up, for the first 2,700 tickets sold. Cost per person after 2,700 tickets are sold is \$23.65. The cost for Astroworld season pass holders for the first 150 tickets sold is \$8, or \$10 after 150 tickets are sold.

Ticket prices include all rides, shows and attractions plus a barbecue dinner, beverages and ice cream. Meal tickets must be redeemed during the 12:30 -3:30 p.m. serving time to receive the free return ticket.

Ticket sales are limited to six per badged employee. Tickets are available through April 2 at both Bldg.11 and Bldg. 3 Exchange Stores.

Women's Outreach develops web site

NASA's Women's Outreach Initiative has created a web site to highlight the ways in which NASA's programs benefit Earthbound families.

The "There's Space in My Life..." initiative presents information in a non-technical, straight-forward way, centered around topics of particular interest to women and their families: health, family, safety, home and garden, travel and leisure time, and the mysteries of Earth and the universe.

NASA's research and technology is not just about distant galaxies, astronauts and supersonic aircraft. The science and engineering that make NASA's programs possible touch lives every day. This influence is most apparent in the field of medicine where innovative thinking has made it possible to adapt deep space technology to understanding, detecting and treating cancer. NASA's research is designed to learn how to live and work in space. Its application, however, often hits much closer to home.

Of special interest is a chronological list of highlights of the contributions women have made to America's space and aeronautics program. The web site also contains information on NASA research and technology that is used to detect and treat heart disease. NASA technology also is used in many types of medical research affecting women.

For more information see the Women's Outreach Initiative web site at: <http://www.nasa.gov/family/index.html>

Black engineers plan banquet to honor scholarship recipients

The National Society of Black Engineers-Houston Alumni Extension will host its first annual scholarship luncheon at 11:30 a.m. April 25 at Brady's Landing.

For information or tickets contact Sabra Crawford at 333-7028.

First female shuttle commander

Collins will lead mission to deploy X-ray telescope

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Ashby. Hawley will be making his fifth space flight during STS-93, having flown previously on STS-41D in 1984, STS-61C in 1986, STS-31 in 1990 and STS-82 in 1997. Coleman has one previous space flight to her credit, having flown on STS-73, the second United States Microgravity Laboratory mission in October/November 1995. Tognini, who spent 14 days on the Mir space station in 1992, will be making his first shuttle flight.

During the five-day mission, the crew will deploy the Advanced X-ray Astrophysics Facility Imaging Sys-

tem, which will conduct comprehensive studies of the universe. AXAF will be the most advanced X-ray telescope ever flown. When scientists begin using AXAF next year, they will finally be able to unlock the secrets of some of the most distant, powerful and violent objects known to exist in the universe. They will study such exotic phenomena as exploding stars called supernovae, strange powerful objects called quasars, and mysterious black holes which are so massive that everything near them is pulled inside causing an explosion of X-rays that AXAF can study.



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ISO 9001 audit success builds on pathfinder efforts

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mally documenting key processes that had been previously undocumented. In other cases, it meant dramatically improving how the center operates, such as in the areas of electronic document repositories, calibrated tool recall processes, inter-organizational agreements, metrics evaluation and preventive action.

All NASA centers are under a requirement from NASA Administrator Daniel S. Goldin to be ISO 9001 registered by September 1999.

Removal of registration status is a tangible threat, Norbraten said, and NQA will audit to ensure the center does not backslide, and that it is

using its management structure to continue to improve processes.

Norbraten said that two pathfinder activities greatly helped lead the way to ISO 9001 success, the Engineering and Safety, Reliability and Quality Assurance Directorates' pilot project in 1995 and 1996, and White Sands registration in 1996. In addition, many of JSC's contractor associates already had undertaken ISO 9000 prior to JSC's commitment. Many others have joined the movement in response to requirements established by NASA contract managers, while still more are doing it to better position themselves for future business with NASA or other customers.